Definitions

- **Air Sparging** Air sparging is a process which is used to remove volatile contaminants (such as gasoline) from ground water. Air sparging introduces fresh air under pressure into the ground water aquifer just below the water table, which "bubbles" through the contaminated ground water, acting as an in situ air stripper. Volatile compounds move upwards through the water table and into the vadose zone. **Soil Vapor Extraction** Soil vapor extraction can be used in conjunction with air sparging or on its own. It imparts a vacuum to the soil overlying the contaminated ground water, thus drawing the volatile compounds from the vadose zone (the soil zone above the permanent ground water level) into the extraction system. The soil vapor extraction system airstream may be run through granular activated carbon to remove volatile compounds prior to discharging the air into the atmosphere if treatment is required. Example of a project using this process: Landfill 4, Fort Lewis, Washington

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Air Stripping The air stripping treatment process relies on the transfer of volatile organic compounds from water into air. Contaminated water enters the top of the air stripping tower and flows down through the packing material in a thin film. An air stream is forced upward through the tower. Within the tower, the contaminants are transferred from the thin film of contaminated water into the flowing air stream. Treated water exits from the

bottom of the tower, while air containing the volatilized contaminants is exhausted through the top of the tower. Any emissions above Clean Air Act standards are treated prior to release. Example of a project using this process: Fort Lewis Logistics Center, Washington

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Bioremediation A process involving the treatment of excavated soils using conventional soil management practices to enhance the microbial degradation of contaminants. Composting is a type of bioremediation where organic building agents are added to promote biodegradation conditions conducive to contaminant reduction. Example of a project using this process: Umatilla Chemical Depot Explosives Washout Lagoon, Hermiston, Oregon

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Contaminated Building Demolition Buildings scheduled for demolition are first surveyed to determine the nature and extent of contaminants present. Contaminants found are typically removed prior to demolition if they could pose a threat to human health or the environment during demolition of the building and they can be safely removed. The noncontaminated debris from demolition is either salvaged or disposed of in a landfill or disposal cell. Examples of projects using this process: Bunker Hill, Kellogg, Idaho Manchester Annex/Old Navy Dump, Manchester, Washington

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Flame Treatment This treatment involves subjecting contaminated building materials, equipment, and piping to fire and high temperatures until the residual explosive contamination is decomposed or volatilized. Example of a project using this process (two versions): Umatilla Chemical Depot Explosives Washout Plant (Adobe Acrobat version). (115k) (For information about obtaining the free Acrobat reader, visit Adobe.) Umatilla Chemical Depot Explosives Washout Plant (Microsoft Word version). (406k)

Low temperature thermal desorption Thermal desorption is a separation or extraction process. The primary function is to remove bound or mixed organic contaminants from soil or sludge using a thermal source. The contaminated soils or sludges are heated, driving off the water and organic contaminants and producing a dry solid containing trace amounts of the organic residue. Example of a project using this process: Remedial Design and Remedial Action at the Solvent Refined Coal Pilot Plant (SRCPP), Fort Lewis, Washington

Natural attenuation The process by which a compound is reduced in concentration over time, through adsorption, degradation, dilution, and/or transformation. Example of a project using this process: Landfill 5, Fort Lewis, Washington

Removal and Disposal of Contaminated Soil Contaminated soils are excavated and disposed of in a landfill or other type of disposal cell which has been certified to accept such waste. The landfill or disposal cell is typically monitored and capped when filled up. Example of a project using this process: Bunker Hill, Kellogg, Idaho

Remedial Investigation (RI) An in-depth investigation with objectives of determining the nature and extent of site contamination and the potential threat to human health and the environment. **Feasibility Study (FS)** A detailed analysis of potential cleanup alternatives for the site. Examples of projects using this process: Old Navy Dump/Manchester Superfund Site, Manchester, Washington Hamilton Island, North Bonneville, Washington Fort Lewis Logistics Center, Fort Lewis, Washington

Sampling and Characterization of Water, Air, Soil, and Sediments Sampling is the process of obtaining samples of a medium, such as soil, suspected of being contaminated. Persons performing the sampling must follow standard procedures to make sure the samples are properly collected, contained, stored, and transported to the laboratory for analysis. Every effort is made to prevent exposure of the samples to factors which might alter and invalidate the analytical results. Example of a project using these processes: Tongue Point, Astoria, OR

Scabbling Scabbling is a process in which a shot blasting apparatus is employed to remove the top layer of a contaminated material such as concrete. The manually operated apparatus chips at the contaminated portion of the material until all of the contaminants have been scabbled off. A hand-held chipping hammer may be employed to scabble the areas inaccessible to the blastrac apparatus. Scabbling is a cost effective method because it does not remove the entire material, only the contaminated portions, and therefore less waste is generated. This process accounts for dust-control, run-off, and physical hazards. There is

Virtually no clean up as all dust and waste materials generated by this process are contained in the apparatus, which can be emptied out and disposed of later. Example of a project using this process: Concrete Clean-up at a Consolidated Farm Service Agency Property, Mabton, Yakima County, WA

Sediment Capping Design Sediment capping is the process where clean borrow material or dredged sediments are deposited to cover--or cap--contaminated underwater sediments. Example of a project using this process: Eagle Harbor Early Action Capping Project, Bainbridge Island, Washington.

Soil Solidification A process that immobilizes the toxic and hazardous constituents in the waste by changing the constituents into immobile forms, binding them in an immobile, insoluble matrix, and/or binding them in a matrix that minimizes the material surface exposed to solvent leaching. Example of a project using this process: Umatilla Chemical Depot, Ammunition Demolition Area, general project description.

Underground Storage Tank (UST) Removal and Replacement Removal of damaged or noncompliant USTs and associated piping, and contaminated soils. This action may involve replacement with new state-of-the-art overflow and spill protection systems. Example of a project using this process: Fort Ward, Bainbridge Island, Washington

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